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Inventor Applicant(s) : O'Brien, T. J. et al.
Serial No. : 09/965,738
Filing Date : September 27, 2001
Title : REPEAT SEQUENCES OF THE CA125 GENE
AND THEIR USE FOR DIAGNOSTIC AND
THERAPEUTIC INTERVENTIONS
Examiner : Unassigned
Group Art Unit : 1645

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TRANSMITTAL OF SUBSTITUTE FORMAL DRAWINGS

Sir:

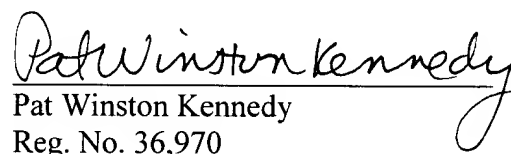
In response to the Notice to File Corrected Application Papers dated November 20, 2001 requesting substitute drawings in compliance with 37 CFR 1.84, Applicants submit herewith substituted formal drawings (FIGS. 1-10) with the requested margin changes incorporated therein.

Kindly direct any other comments or requests with respect to this application to the undersigned Counsel.

No fees are believed to be due since this submission is being filed within the two month response period. However, should a fee be due, the Assistant Commissioner is authorized to charge such fee to Deposit Account No. 16-1435. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

Date: December 4, 2001


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Structure of Amino Terminal Domain

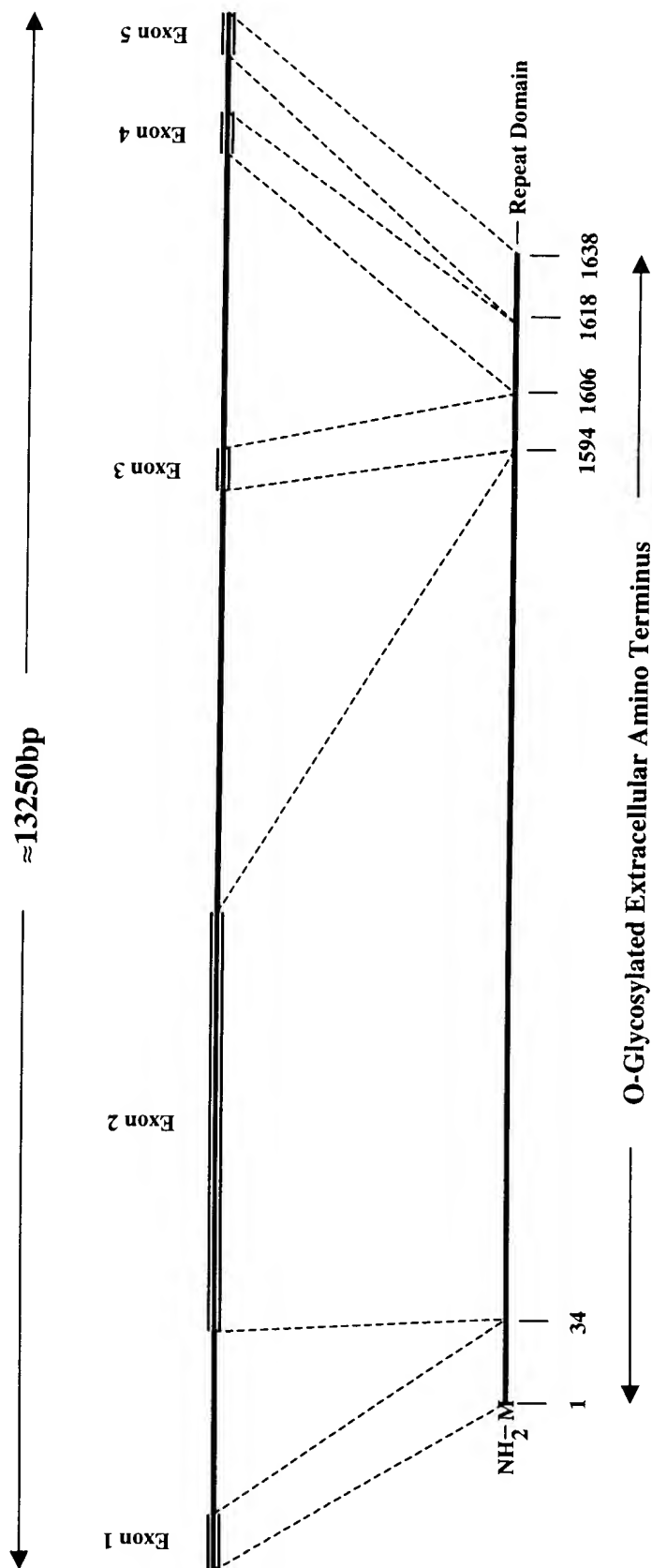


Figure 8A

1	MEHITKIPNE	AAHGT ⁰ IRPV	KGQ ⁰⁰⁰⁰ TS ⁰⁰⁰⁰ SPSA	SPKGLHTGGT	KRMET ⁰⁰⁰⁰ TITATL	901	ISATFP ⁰ VE	SPHE ⁰⁰⁰⁰ SEATAS	WVTHPAV ⁰⁰⁰⁰ TS ⁰⁰⁰⁰	TVPR ⁰⁰⁰⁰ TIPNYS	HSEPD ⁰⁰⁰⁰ T ⁰⁰⁰⁰ PS ⁰⁰⁰⁰
51	KTTIT ⁰⁰⁰⁰ TALK ⁰⁰ TT	SRAT ⁰⁰⁰⁰ LTSVY	TP ⁰⁰ LGLT ⁰⁰ PL	NAS ⁰⁰ RQWASTI	LTEM ⁰⁰ MITPY	951	ATSP ⁰⁰⁰⁰ GAET ⁰⁰	DFPT ⁰⁰ LTVSPD	VPDMV ⁰⁰⁰⁰ TSQV ⁰⁰⁰⁰	SSG ⁰⁰⁰⁰ TOTSITI	P ⁰⁰⁰⁰ LFLSSGEP
1101	VFPDVE ⁰⁰⁰⁰ PETTS	SLAT ⁰⁰ SLGAET	STAL ⁰⁰ PR ⁰⁰ TIPS	VLNRE ⁰⁰ SETTA	SLVSR ⁰⁰ GAEAR	1001	ET ⁰⁰⁰⁰ TTSFI ⁰⁰ YS	ETH ⁰⁰⁰⁰ TS ⁰⁰⁰⁰ SAIPT	LPVSPG ⁰⁰⁰⁰ ASKM	L ⁰⁰⁰⁰ TSLV ⁰⁰⁰⁰ ISSG ⁰⁰⁰⁰ T	DS ⁰⁰⁰⁰ TTF ⁰⁰⁰⁰ PL ⁰⁰⁰⁰ T
1151	SPVIO ⁰⁰⁰⁰ LDVS	SS ⁰⁰⁰⁰ EPD ⁰⁰⁰⁰ TASW	VIHPAET ⁰⁰ IP ⁰⁰	VSK ⁰⁰ T ⁰⁰ TENFEH	SELD ⁰⁰ T ⁰⁰ VSSTA	1051	EP ⁰⁰⁰⁰ YEPETTA	IQLIHPAETN	TMVPR ⁰⁰⁰⁰ T ⁰⁰⁰⁰ PKF	SHSK ⁰⁰⁰⁰ SD ⁰⁰⁰⁰ TLLP	VAI ⁰⁰⁰⁰ SPGPEA
1201	TSHGAD ⁰⁰⁰⁰ VSSA	IP ⁰⁰⁰⁰ TNISPSEL	DALT ⁰⁰ PLV ⁰⁰ TI ⁰⁰ S	G ⁰⁰⁰⁰ DT ⁰⁰ ST ⁰⁰ FP ⁰⁰	L ⁰⁰⁰⁰ IKSPHERET	1101	SS ⁰⁰⁰⁰ AV ⁰⁰⁰⁰ T ⁰⁰⁰⁰ IS	PDMSDLV ⁰⁰⁰⁰ TS ⁰⁰⁰⁰ L	VPSSG ⁰⁰⁰⁰ DT ⁰⁰⁰⁰ TS ⁰⁰⁰⁰	TP ⁰⁰⁰⁰ L ⁰⁰⁰⁰ SE ⁰⁰⁰⁰ TPY	EPE ⁰⁰⁰⁰ TATW ⁰⁰⁰⁰ L ⁰⁰⁰⁰
1251	RTTWL ⁰⁰⁰⁰ THPAE	TSS ⁰⁰⁰⁰ TIP ⁰⁰⁰⁰ RTIP	NFSHES ⁰⁰⁰⁰ DAT	PS ⁰⁰⁰⁰ AT ⁰⁰⁰⁰ SPGAE	TSSAIP ⁰⁰⁰⁰ IMTV	1151	HPAET ⁰⁰⁰⁰ TS ⁰⁰⁰⁰ VS	GTIP ⁰⁰⁰⁰ NFSHRG	SD ⁰⁰⁰⁰ APS ⁰⁰⁰⁰ VM ⁰⁰⁰⁰ TS	PGVD ⁰⁰⁰⁰ TR ⁰⁰⁰⁰ SGVP	TT ⁰⁰⁰⁰ TIP ⁰⁰⁰⁰ PS ⁰⁰⁰⁰ IG
1301	SPGAED ⁰⁰⁰⁰ LV ⁰⁰ TS	QVTSSG ⁰⁰⁰⁰ TD ⁰⁰ RN	MTIPT ⁰⁰⁰⁰ L ⁰⁰⁰⁰ TS ⁰⁰	GE ⁰⁰⁰⁰ PT ⁰⁰⁰⁰ IASLV	THPEA ⁰⁰⁰⁰ Q ⁰⁰⁰⁰ TSSA	1201	VV ⁰⁰⁰⁰ TSQV ⁰⁰⁰⁰ TS ⁰⁰⁰⁰ SA	TD ⁰⁰⁰⁰ IS ⁰⁰⁰⁰ PAIPTL	TPSPGE ⁰⁰⁰⁰ PE ⁰⁰⁰⁰ TT	ASSA ⁰⁰⁰⁰ THPG ⁰⁰⁰⁰ TQ	TGFTV ⁰⁰⁰⁰ PIR ⁰⁰⁰⁰ V
1351	IP ⁰⁰⁰⁰ TSTISPAV	SRLV ⁰⁰⁰⁰ TSMV ⁰⁰⁰⁰ TS	LAAK ⁰⁰⁰⁰ TS ⁰⁰⁰⁰ ITNR	AL ⁰⁰⁰⁰ NS ⁰⁰⁰⁰ GEPA	T ⁰⁰⁰⁰ VS ⁰⁰⁰⁰ LV ⁰⁰⁰⁰ THPA	1251	PSSE ⁰⁰⁰⁰ PD ⁰⁰⁰⁰ TMAS	WV ⁰⁰⁰⁰ HP ⁰⁰⁰⁰ PO ⁰⁰⁰⁰ TS	PV ⁰⁰⁰⁰ SR ⁰⁰⁰⁰ TS ⁰⁰⁰⁰ SFS	HSSPD ⁰⁰⁰⁰ AT ⁰⁰⁰⁰ PVM	ATSP ⁰⁰⁰⁰ KTEASS
1401	QSP ⁰⁰⁰⁰ TPV ⁰⁰⁰⁰ EW ⁰⁰⁰⁰ TT	SIF ⁰⁰⁰⁰ FSK ⁰⁰⁰⁰ SD ⁰⁰⁰⁰ T	TP ⁰⁰⁰⁰ SM ⁰⁰⁰⁰ T ⁰⁰⁰⁰ SHGA	ESS ⁰⁰⁰⁰ SAV ⁰⁰⁰⁰ TP ⁰⁰⁰⁰ T	VSTE ⁰⁰⁰⁰ VPGVV ⁰⁰⁰⁰ T	1301	AVL ⁰⁰⁰⁰ T ⁰⁰⁰⁰ IS ⁰⁰⁰⁰ PGA	PEM ⁰⁰⁰⁰ V ⁰⁰⁰⁰ TSQ ⁰⁰⁰⁰ IS	SGAAT ⁰⁰⁰⁰ ST ⁰⁰⁰⁰ TRVP	TL ⁰⁰⁰⁰ HS ⁰⁰⁰⁰ PG ⁰⁰⁰⁰ ME	TTALL ⁰⁰⁰⁰ ST ⁰⁰⁰⁰ HR
1451	PLV ⁰⁰⁰⁰ TSSRAVI	ST ⁰⁰⁰⁰ IT ⁰⁰⁰⁰ IL ⁰⁰⁰⁰ TS	PGE ⁰⁰⁰⁰ PT ⁰⁰⁰⁰ TS ⁰⁰⁰⁰ SM	AT ⁰⁰⁰⁰ SHGEA ⁰⁰⁰⁰ SS	AIP ⁰⁰⁰⁰ TP ⁰⁰⁰⁰ VS ⁰⁰⁰⁰ PG	1351	TETS ⁰⁰⁰⁰ KT ⁰⁰⁰⁰ TPAS	TV ⁰⁰⁰⁰ FQV ⁰⁰⁰⁰ SE ⁰⁰⁰⁰ IT	ASL ⁰⁰⁰⁰ IRPGAE	TS ⁰⁰⁰⁰ AL ⁰⁰⁰⁰ PPQ ⁰⁰⁰⁰ TT	SSL ⁰⁰⁰⁰ FTLLV ⁰⁰⁰⁰ TG
1501	VPGV ⁰⁰⁰⁰ TSLV ⁰⁰⁰⁰ T	SS ⁰⁰⁰⁰ RAV ⁰⁰⁰⁰ TS ⁰⁰⁰⁰ TTI	PIL ⁰⁰⁰⁰ TS ⁰⁰⁰⁰ LGEP	ET ⁰⁰⁰⁰ PS ⁰⁰⁰⁰ MA ⁰⁰⁰⁰ SH	GTEA ⁰⁰⁰⁰ SAV ⁰⁰⁰⁰ TP	1401	TSR ⁰⁰⁰⁰ VDLS ⁰⁰⁰⁰ PTA	SPGV ⁰⁰⁰⁰ SAKTAP	LS ⁰⁰⁰⁰ THPG ⁰⁰⁰⁰ ETS	TMIP ⁰⁰⁰⁰ TS ⁰⁰⁰⁰ LSL	GLLET ⁰⁰⁰⁰ TGLLA
1551	VLPE ⁰⁰⁰⁰ VP ⁰⁰⁰⁰ GMVT	SLVASS ⁰⁰⁰⁰ RAV ⁰⁰⁰⁰ T	ST ⁰⁰⁰⁰ AL ⁰⁰⁰⁰ PTL ⁰⁰⁰⁰ TS	PGE ⁰⁰⁰⁰ PT ⁰⁰⁰⁰ TS ⁰⁰⁰⁰ SM	AT ⁰⁰⁰⁰ SHGAE ⁰⁰⁰⁰ SS	1451	TSS ⁰⁰⁰⁰ SAET ⁰⁰⁰⁰ TS	TL ⁰⁰⁰⁰ TV ⁰⁰⁰⁰ SPAV	SG ⁰⁰⁰⁰ ISSA ⁰⁰⁰⁰ SI ⁰⁰⁰⁰ TT	DKPQ ⁰⁰⁰⁰ TV ⁰⁰⁰⁰ TSW ⁰⁰⁰⁰ N	TETS ⁰⁰⁰⁰ PS ⁰⁰⁰⁰ VS
1601	TP ⁰⁰⁰⁰ TV ⁰⁰⁰⁰ VSPEVP	GVV ⁰⁰⁰⁰ TSLV ⁰⁰⁰⁰ TS	SGV ⁰⁰⁰⁰ NS ⁰⁰⁰⁰ TSIPT	LIL ⁰⁰⁰⁰ SPGE ⁰⁰⁰⁰ LET	TP ⁰⁰⁰⁰ SMAT ⁰⁰⁰⁰ SHCA	1501	GPEE ⁰⁰⁰⁰ FS ⁰⁰⁰⁰ RTV ⁰⁰⁰⁰ T	G ⁰⁰⁰⁰ TM ⁰⁰⁰⁰ LI ⁰⁰⁰⁰ PSE	MP ⁰⁰⁰⁰ PK ⁰⁰⁰⁰ TS ⁰⁰⁰⁰ HG	EGVSP ⁰⁰⁰⁰ TI ⁰⁰⁰⁰ LIR	TTMVEAT ⁰⁰⁰⁰ NLA
1651	EASS ⁰⁰⁰⁰ AV ⁰⁰⁰⁰ TP ⁰⁰⁰⁰ T</										

Figure 8B (SEQ ID NO: 299)

Structure of Carboxy Terminal Domain

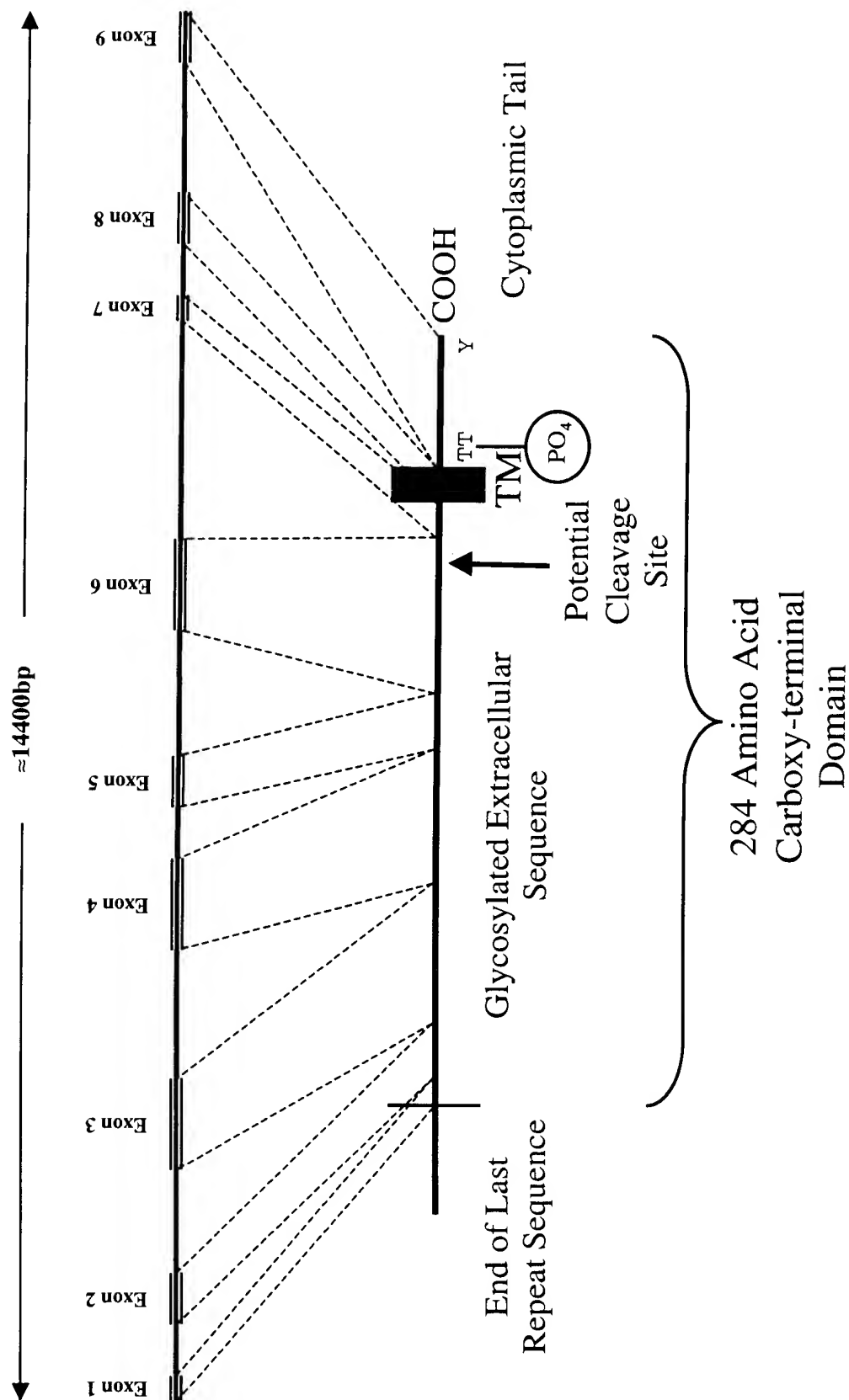


Figure 9A

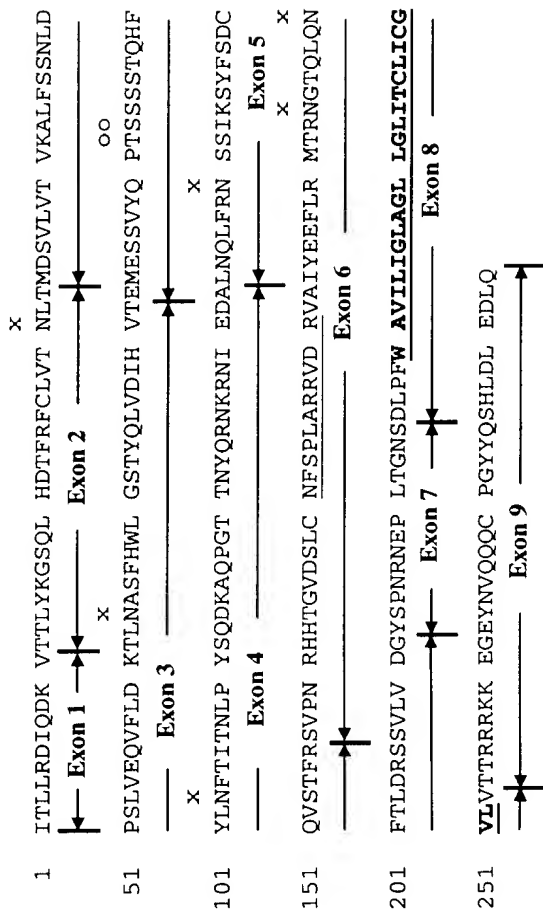


Figure 9B (SEQ ID NO: 300)

Proposed Structure of CA125

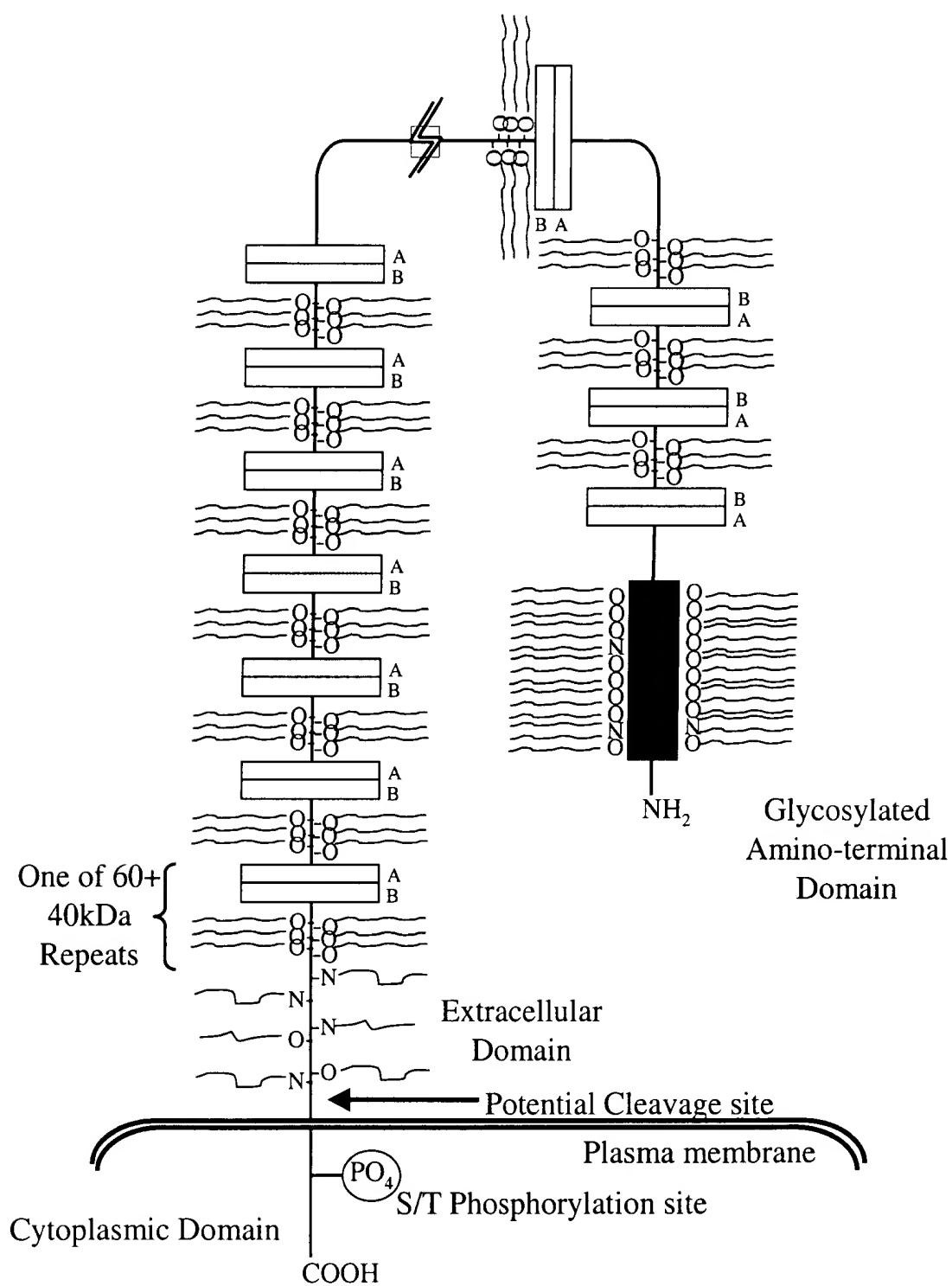


Figure 10

Cyanogen Bromide (CNBr) Cleavage

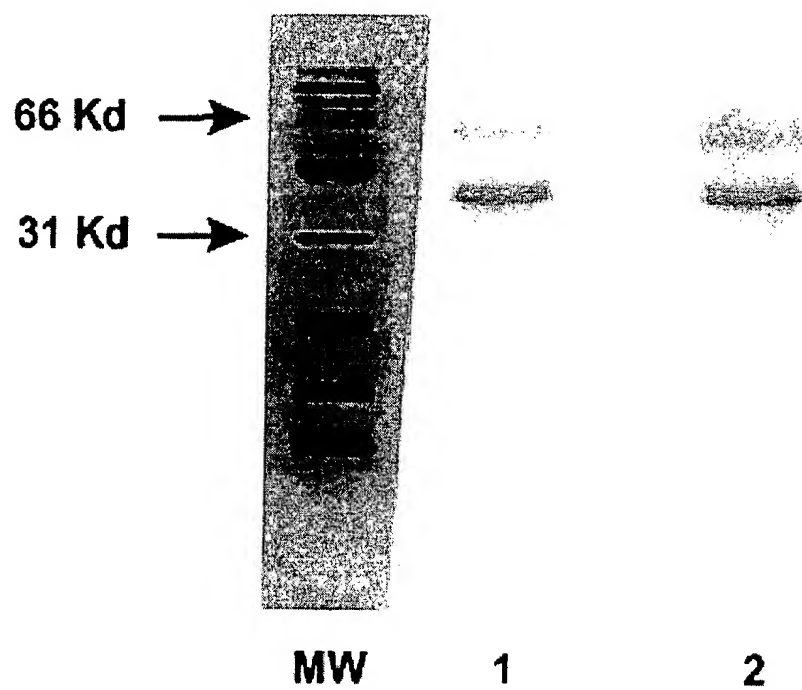


Figure 1

[illegible]

A



500 bases



CA125

β -Tubulin

Figure 2

A Strategy for Placing Repeat Sequences in Contiguous Order Using Overlap

Sequence Allignment

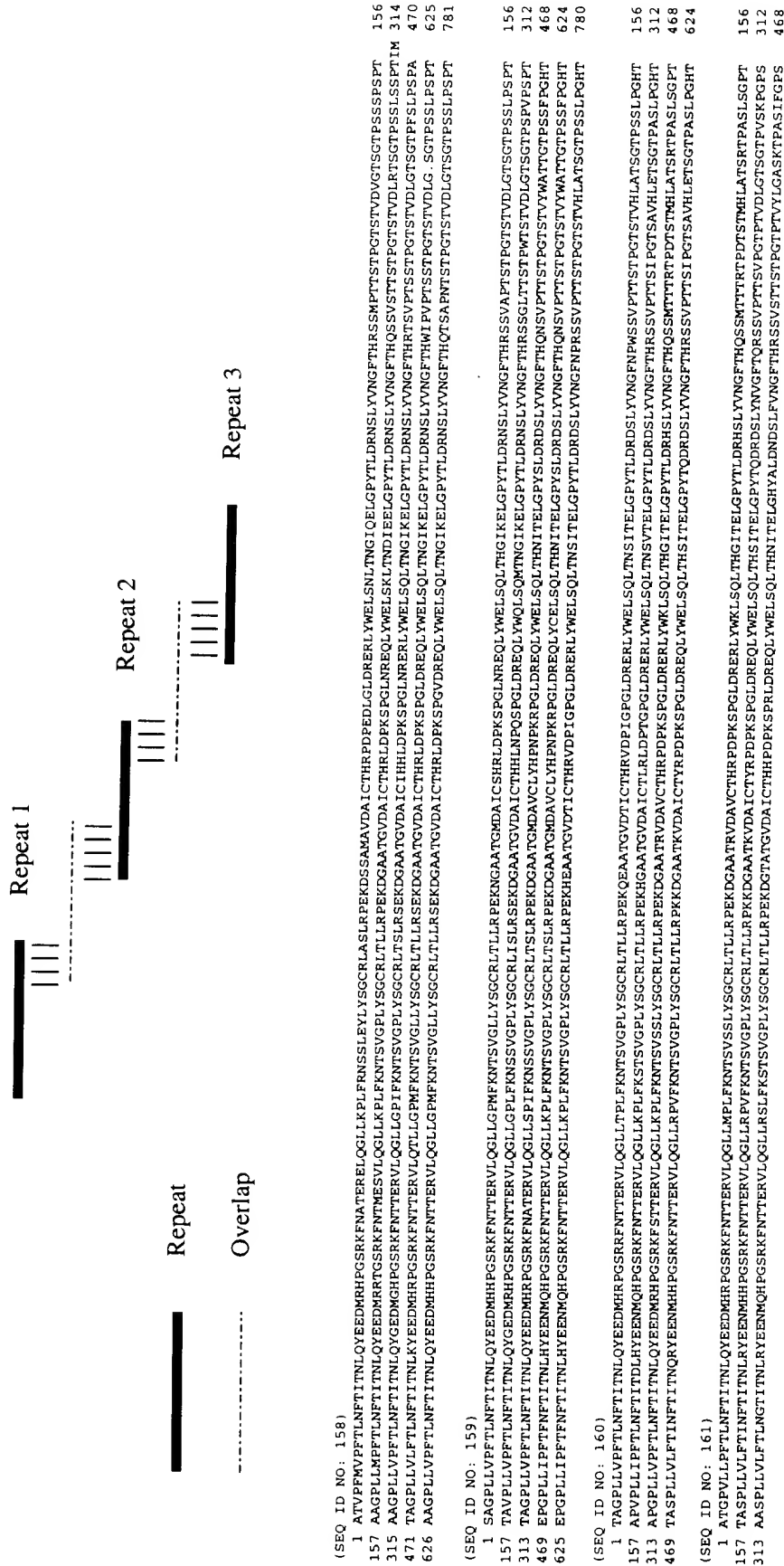
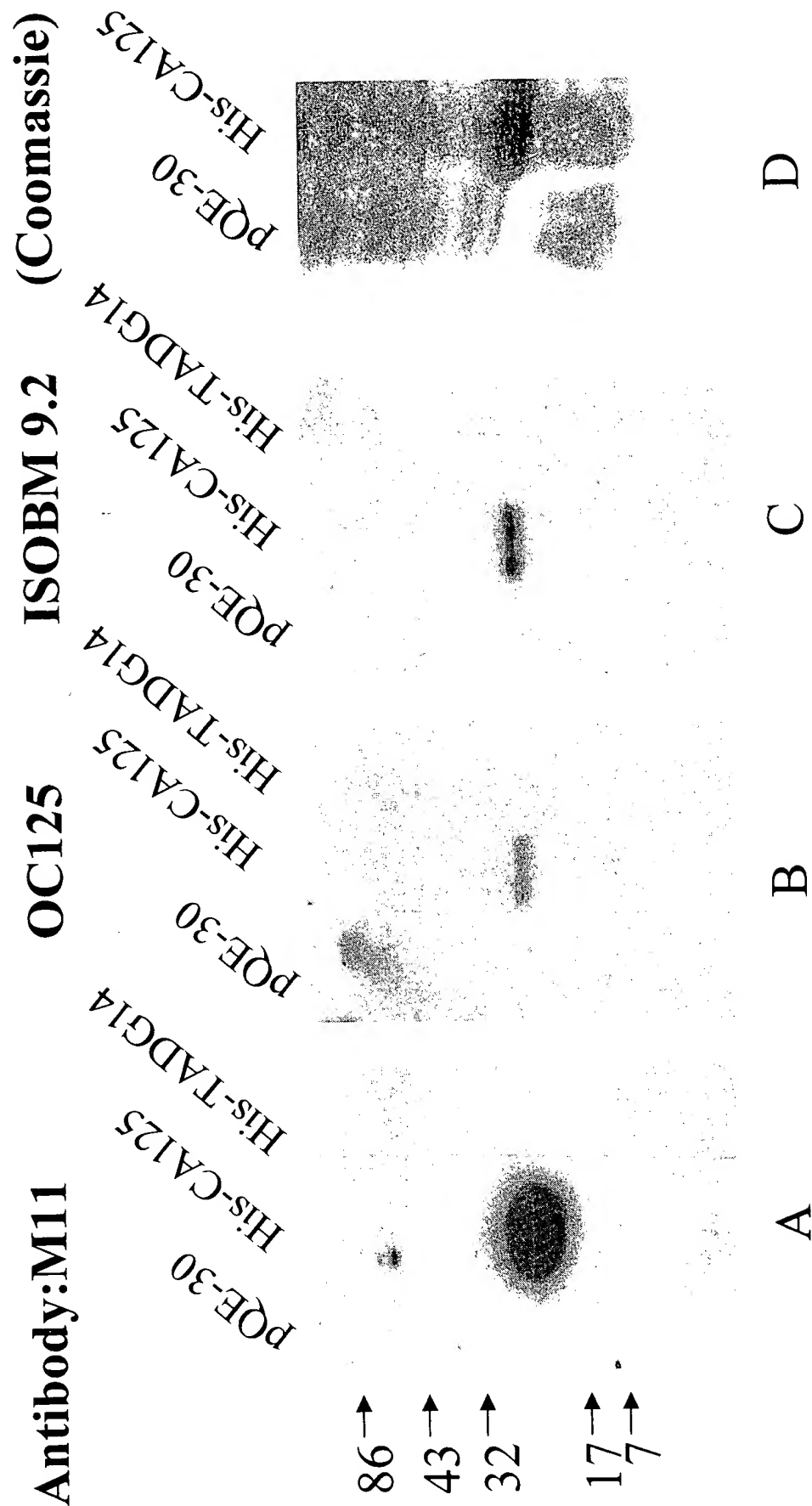


Figure 3 (SEQ ID NOS: 158, 159, 160, and 161)



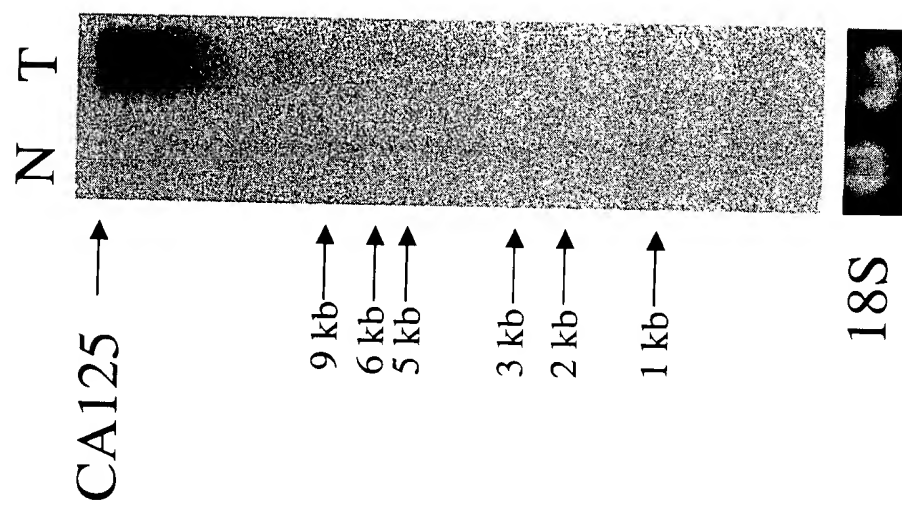
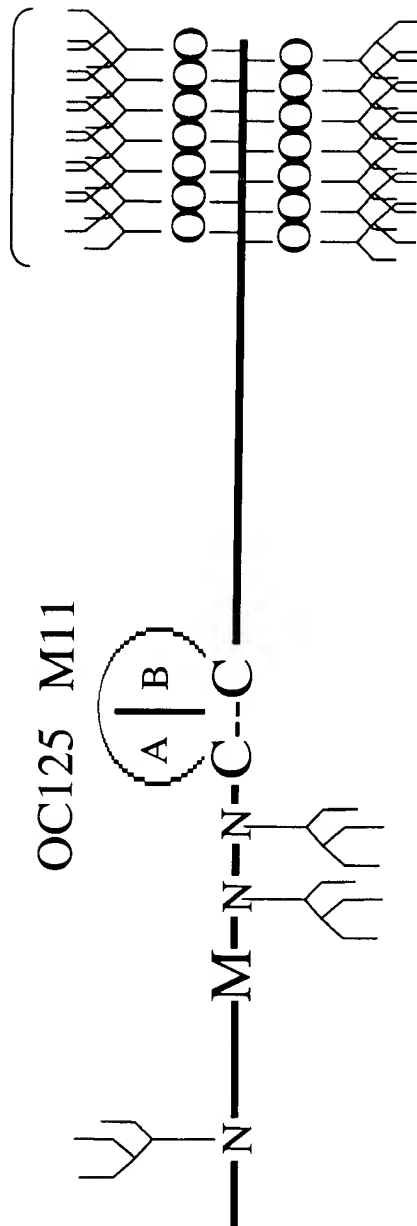


Figure 6

Heavily
O-glycosylated



156 amino acids
repeated 60+ times

Figure 7A

Genomic Structure of a 156 Amino Acid Repeat Sequence of CA125

Genomic Structure of a 156 Amino Acid Repeat Sequence of CA125

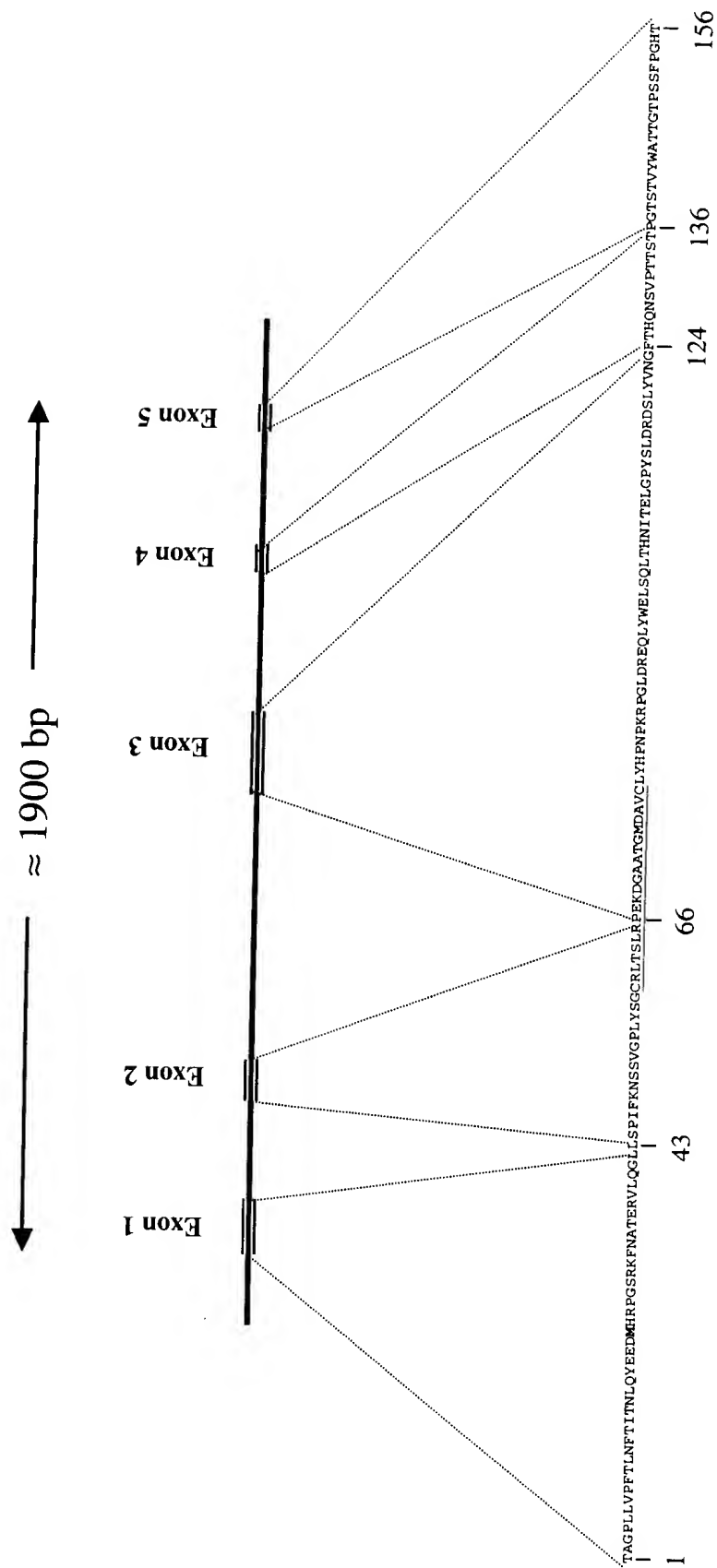


Figure 7B (SEQ ID NO: 163)

Exon 1

1 42

ATVPFMVPFTLNFTITNLQYEEDMRHGPSRKFNATERELQGL (SEQ ID NO: 164)

TAVPLLVPFTLNFTITNLQYGEDMRHGPSRKFNTERVLQGL (SEQ ID NO: 165)

VGPPLLVPFTLNFTITNLQYEEAMRHPGSRKFNTERVLQGL (SEQ ID NO: 166)

APGPLLVPFTLNFTITNLQYEEDMRHGPSRKFNTERVLQGL (SEQ ID NO: 167)

APGPLLVPFTLNFTITNLQYEEDMRHGPSRKFNTERVLQGL (SEQ ID NO: 168)

APGPLLVPFTLNFTITNLQYEVDMRHPGSRKFNTERVLQGL (SEQ ID NO: 169)

SAGPLLVPFTLNFTITNLQYEEDMRHGPSRKFNTERVLQGL (SEQ ID NO: 170)

AAGPLLMPTLNFTITNLQYEEDMRRTGSRKFNTEMESVLQGL (SEQ ID NO: 171)

TASPLLVLFTINCTITNLQYEEDMRRTGSRKFNTEMESVLQGL (SEQ ID NO: 172)

AAGPLLVPFTLNFTITNLQYGEDMGHGPSRKFNTERVLQGL (SEQ ID NO: 173)

TAGPLLIPTLNFTITNLQYGEDMGHGPSRKFNTERVLQGL (SEQ ID NO: 174)

TAGPLLVPFTLNFTITNLQYGEDMGHGPSRKFNTERVLQGL (SEQ ID NO: 175)

TAGPLLVLFTLNFTITNLQYEEDMRHPGSRKFNTERVLQGL (SEQ ID NO: 176)

TAGPLLVPFTLNFTITNLQYEEDMRHPGSRKFNATERVLQGL (SEQ ID NO: 177)

TAGPLLVPFTLNFTITNLQYEEDMRHPGSRRFNTERVLQGL (SEQ ID NO: 178)

TAGPLLVPFTLNFTITNLQYEEDMRHPGSRKFNTERVLQGL (SEQ ID NO: 179)

APVPLLIPTLNFTITNLQYEEDMRHPGSRKFNTERVLQGL (SEQ ID NO: 180)

ATGPVLLPFTLNFTITNLQYEEDMRHPGSRKFNTERVLQGL (SEQ ID NO: 181)

AAGPLLVPFTLNFTITNLQYEEDMHHGPSRKFNTERVLQGL (SEQ ID NO: 182)

SAGPLLVPFTLNFTITNLQYEEDMHHGPSRKFNTERVLQGL (SEQ ID NO: 183)

TASPLLVLFTINFTITNLQRYEENMHHGPSRKFNTERVLQGL (SEQ ID NO: 184)

TASPLLVLFTINFTITNLRYEENMHHGPSRKFNTERVLQGL (SEQ ID NO: 185)

EPGPLLIPTFNFTITNLHYEENMQHGPSRKFNTERVLQGL (SEQ ID NO: 186)

EPGPLLIPTFNFTITNLRYEENMQHGPSRKFNTERVLQGL (SEQ ID NO: 187)

APVPLLIPTLNFTITNLHYEENMQHGPSRKFNTERVLQGL (SEQ ID NO: 188)

APVPLLIPTLNFTITDLHYEENMQHGPSRKFNTERVLQGL (SEQ ID NO: 189)

AASPLLVLFTLNFTITNLRYEENMQHGPSRKFNTERVLQGL (SEQ ID NO: 190)

TAGPLLVPFTLNFTITNLQYEEDMHCPSRKFNTERVLQGL (SEQ ID NO: 191)

AASHLLILFTLNFTITNLRYEENMW.PGSRKFNTERVLQGL (SEQ ID NO: 192)

TGVVSEEPFTLNFTINNLRYMADMGQPGSLKFNITDNVMKHL (SEQ ID NO: 193)

AMGYHLKTLTNFTISNLQYSPDMGKGSATFNSTEGVLQHLL (SEQ ID NO: 194)

Figure 7C

Exon 2

43	65	
LKPLFRNSSLEYLYSGCRLASLR	(SEQ ID NO: 195)	
LKPLFKNTSVSSLYSGCRLTLLR	(SEQ ID NO: 196)	
LKPLFKNTSVGPLYSGCRLTLLR	(SEQ ID NO: 197)	
LKPLFKSTSVGPLYSGCRLTLLR	(SEQ ID NO: 198)	
LKPLFKSTSVGPLYSSCRLTLLR	(SEQ ID NO: 199)	
LKPLFKNTSVGPLYSGCRLTSLR	(SEQ ID NO: 200)	
LGPIFKNTSVGPLYSGCRLTSLR	(SEQ ID NO: 201)	
LGPMFKNTSVGLLYSGCRLTLLR	(SEQ ID NO: 202)	
LGPMFKNTSVGPLYSGCRLTLLR	(SEQ ID NO: 203)	
LGPMFKNTSVGPLYSGCRLTSLR	(SEQ ID NO: 204)	
LGPLFKNSSVGPLYSGCRLISLR	(SEQ ID NO: 205)	
LGPLFKNSSVDPLYSGCRLTSLR	(SEQ ID NO: 206)	
LSPIFKNSSVGPLYSGCRLTSLR	(SEQ ID NO: 207)	
LSPIFKNTSVGPLYSGCRLTLLR	(SEQ ID NO: 208)	
LSPLFQRSSLGARYTGCRVIALR	(SEQ ID NO: 209)	
LRPLFKNTSVSSLYSGCRLTLLR	(SEQ ID NO: 210)	
LRPLFKNTSVGPLYSGSRLTLLR	(SEQ ID NO: 211)	
LRPLFKNTSIGPLYSSCRLTLLR	(SEQ ID NO: 212)	
LRPLFKSTSVGPLYSGCRLTLLR	(SEQ ID NO: 213)	
LRPVFKNTSVGLLYSGCRLTLLR	(SEQ ID NO: 214)	
LRPVFKNTSVGPLYSGCRLTLLR	(SEQ ID NO: 215)	
LRSLFKSTSVGPLYSGCRLTLLR	(SEQ ID NO: 216)	
LRSLFKSTSVGPLYSGCRLTSLR	(SEQ ID NO: 217)	
LTPLFKNTSVGPLYSGCRLTLLR	(SEQ ID NO: 218)	
LTPLFRNTSVSSLYSGCRLTLLR	(SEQ ID NO: 219)	
LMPLFKNTSVSSLYSGCRLTLLR	(SEQ ID NO: 220)	
RPLFQKSSM.GPFYLGCLISLR	(SEQ ID NO: 221)	

Figure 7C

Exon 3

66

123

PEKDSSAMAVDAICTHRPDPEDLGLDRERLYWELSNLTNGIQELGPYTLDRNSLYVNG (SEQ ID NO: 222)
 PEKDGAATGVDAICTHRLDPKSPGLNREQLYWELSKLTNDIEELGPYTLDRNSLYVNG (SEQ ID NO: 223)
 PKKDGAATGVDAICTHRLDPKSPGLNREQLYWELSKLTNDIEELGPYTLDRNSLYVNG (SEQ ID NO: 224)
 PEKDGATATGVDAICTHHPDPKSPRLDREQLYWELSQLTHNITELGHYALDNDSLFVNG (SEQ ID NO: 225)
 PEKDGEATGVDAICTHRPDPGPGLDREQLYLELSQLTHSITELGPYTLDRDSLYVNG (SEQ ID NO: 226)
 PEKDGAATGMDAVCLYHPNPKRPGLDREQLYWELSQLTHNITELGPYSLDRDSLYVNG (SEQ ID NO: 227)
 PEKDGAATGMDAVCLYHPNPKRPGLDREQLYCELSQLTHNITELGPYSLDRDSLYVNG (SEQ ID NO: 228)
 PEKDGAATRVDAACTYRPDPKSPGLDREQLYWELSQLTHSITELGPYTLDRVSLYVNG (SEQ ID NO: 229)
 PKKDGAATKVDAICTYRPDPKSPGLDREQLYWELSQLTHSITELGPYTQDRDSLYVNG (SEQ ID NO: 230)
 PKKDGAATKVDAICTYRPDPKSPGLDREQLYWELSQLTHSITELGPYTQDRDSLYVNG (SEQ ID NO: 231)
 PEKDGAATRVDVCTHRPDPKSPGLDRERLYWKLSQLTHGITELGPYTLDRHSLYVNG (SEQ ID NO: 232)
 PEKDGVATRVDICTHRPDKIPGLDRQQLYWELSQLTHSITELGPYTLDRDSLYVNG (SEQ ID NO: 233)
 SEKDGAATGVDAICIHLDPKSPGLNRERLYWELSQLTNGIKELGPYTLDRNSLYVNG (SEQ ID NO: 234)
 SEKDGAATGVDAICTHRLDPKSPGLDREQLYWELSQLTNGIKELGPYTLDRNSLYVNG (SEQ ID NO: 235)
 SEKDGAATGVDAICTHRLDPKSPGVDRQQLYWELSQLTNGIKELGPYTLDRNSLYVNG (SEQ ID NO: 236)
 SEKDGAATGVDAICTHRVDPKSPGVDRQQLYWELSQLTNGIKELGPYTLDRNSLYVNG (SEQ ID NO: 237)
 SEKDGAATGVDAICTHHLNQPSPGLDREQLYWQLSQMTNGIKELGPYTLDRNSLYVNG (SEQ ID NO: 238)
 PEKRGAAATGVDICTHRLDPLNPGLDREQLYWELSKLTRGIIELGPYLLDRGSLYVNG (SEQ ID NO: 239)
 PEKNGAATGMDAICSHRLDPKSPGLNREQLYWELSQLTHGITELGPYTLDRNSLYVNG (SEQ ID NO: 240)
 PEKNGAATGMDAICSHRLDPKSPGLDREQLYWELSQLTHGITELGPYTLDRNSLYVNG (SEQ ID NO: 241)
 PEKHGAATGVDAICTLRLDPTGPGLDREQLYWELSQLTNSITELGPYTLDRDSLYVNG (SEQ ID NO: 242)
 PEKHGAATGVDAICTLRLDPTGPGLDREQLYWELSQLTNSITELGPYTLDRDSLYVNG (SEQ ID NO: 243)
 PEKHEAATGVDICTHRVDPGPGLDREQLYWELSQLTNSITELGPYTLDRDSLYVNG (SEQ ID NO: 244)
 PEKQEAATGVDICTHRVDPGPGLDREQLYWELSQLTNSITELGPYTLDRDSLYVNG (SEQ ID NO: 245)
 PEKQEAATGVDICTHRVDPGPGLDREQLYWELSQLTNSITELGPYTLDRDSLYVDG (SEQ ID NO: 246)
 PEKDKAATRVDICTHHPDPQSPGLNREQLYWELSQLTHGITELGPYTLDRDSLYVDG (SEQ ID NO: 247)
 SVKNGAETRVDLLCTYLQPLSGPGLPIKQVFHELSQLQTHGITRGPYSLDKDSLYLNG (SEQ ID NO: 248)
 PEKDGAATGVDTTCTYHPDPVGPGLDIQQLYWELSQLTHGVTQLGFVVLDRDSLFIN (SEQ ID NO: 249)

Figure 7C

Exon 4

124 135
 FTHRSMPTTST (SEQ ID NO: 250)
 FTHRSMPTTST (SEQ ID NO: 251)
 FTHRSTSVPTSST (SEQ ID NO: 252)
 FTHRSTSVPTTST (SEQ ID NO: 253)
 FTHRSSVPTTSS (SEQ ID NO: 254)
 FTHRSSVPTTST (SEQ ID NO: 255)
 FTHRSSVAPTST (SEQ ID NO: 256)
 FTHRSSGLTTST (SEQ ID NO: 257)
 FTHRSGGLTTST (SEQ ID NO: 258)
 FTHRSSFLTST (SEQ ID NO: 259)
 FTHRNFVPITST (SEQ ID NO: 260)
 FTHRSSVPTTST (SEQ ID NO: 261)
 FTHQSSVPTTST (SEQ ID NO: 262)
 FTHQTSAPNTST (SEQ ID NO: 263)
 FTHQTFAPNTST (SEQ ID NO: 264)
 FTHQNSVPTTST (SEQ ID NO: 265)
 FTHQSSMTTST (SEQ ID NO: 266)
 FTHWIPVPTSST (SEQ ID NO: 267)
 FTHWSPITPTST (SEQ ID NO: 268)
 FTHWSSGLTTST (SEQ ID NO: 269)
 FHRSSVPTTST (SEQ ID NO: 270)
 FNRSSVPTTST (SEQ ID NO: 271)
 FNPWSSVPTTST (SEQ ID NO: 272)
 FTQRSSVPTTST (SEQ ID NO: 273)
 FTQRSSVPTTST (SEQ ID NO: 274)
 FTQRSSVPTTST (SEQ ID NO: 275)
 YNEPGLDEPPTT (SEQ ID NO: 276)
 YAPQNLIRGEY (SEQ ID NO: 277)

Exon 5

136 156
 PGTSTVDVGTSGTPSSSPSPT (SEQ ID NO: 278)
 PGTSTVDLRTSGTPSSLSSPTIM (SEQ ID NO: 279)
 PGTSTVDLGTSGTPFSLPSA (SEQ ID NO: 280)
 PGTSTVDLG.SGTPSSLPSPT (SEQ ID NO: 281)
 PGTSTVDLG.SGTPSLPSPT (SEQ ID NO: 282)
 PGTSTVDLGTSGTPSSLPSPT (SEQ ID NO: 283)
 PGTPTVDLGTSGTPVSKPGPS (SEQ ID NO: 284)
 PWTSTVDLGTSGTPSPVPSPT (SEQ ID NO: 285)
 PGTSTVYWATTGTPSSFPGHT (SEQ ID NO: 286)
 PGTSTVHLATSGTPSSLPGHT (SEQ ID NO: 287)
 PGTSTVHLATSGTPSLPGHT (SEQ ID NO: 288)
 PDTSTMHLATSRTPASLSGPT (SEQ ID NO: 289)
 PGTSVHLETSGTPASLPHT (SEQ ID NO: 290)
 PGTSVHLETGTPSSFPHT (SEQ ID NO: 291)
 PGTSTVHLGTSETPSSLPRPI (SEQ ID NO: 292)
 PGTSIVNLGTSGIPPSLPETT (SEQ ID NO: 293)
 PGTFTVQPETSETPSSLPHT (SEQ ID NO: 294)
 PGTPTVDLGTSGTPVSKPGPS (SEQ ID NO: 295)
 PGTPTVYLGASKTPASIFGPS (SEQ ID NO: 296)
 PKPATTFLPPLSEATT (SEQ ID NO: 297)
 QINFHIVNWNLSNPDPTSSEY (SEQ ID NO: 298)

Figure 7C